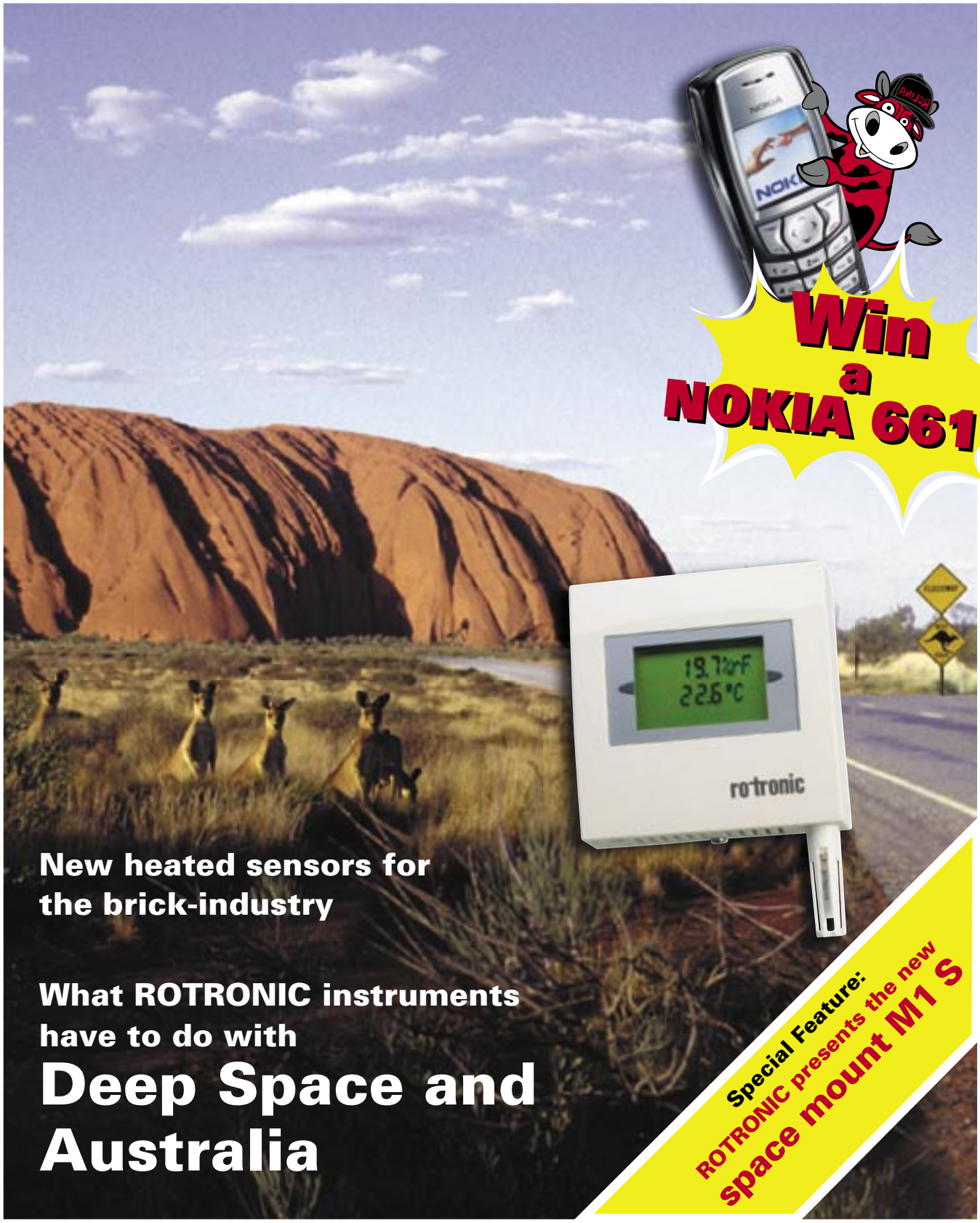
rotronic

Humidity news

Issue 1/2003



New heated sensors for the brick-industry

What ROTRONIC instruments have to do with

Deep Space and Australia

Special Feature: ROTRONIC presents the new space mount M1 S

PREFACE

Peter Müller
Product Manager
ROTRONIC AG

The aim of Humidity News is to increase the awareness of potential solutions for Process-Automation, HVAC, Conservation and OEM applications. These are increasingly interesting for our customers and business partners. Rotronic are amongst very few manufacturers of humidity measurement equipment with the focus and flexibility to satisfy the range of applications that today's high-tech industry's demand. Today's instrumentation user expects the optimum solution for their measurement applications, whilst meeting budget limits, and without high maintenance costs. Our range of digital humidity instrumentation satisfies the current market needs, whilst incorporating the flexibility to be compatible with the latest information technology.

Out latest new product, the M1-Series, introduced on page 4, fulfils these market demands and is lower in cost than the product it replaces.

ROTRONIC began producing measurement instruments for the paper industry in 1965. Today with our new BFC-DIO, online ERH measurement enters the digital age. This probe is capable of measuring humidity at the moving web in the paper-, printing- and textile-industries.

There is virtually no area of industry where humidity is not important. Within this issue you will find applications as diverse as the brick industry and deep space communication! The growth in interest of humidity as a measurement parameter and consequentially the growth in its commercial and environmental significance cannot be underestimated.

On page 11 we give you an insight into our production department, where our highly skilled and motivated team work tirelessly to produce high quality products for every ROTRONIC order.

We are also happy to publish your contributions of interesting applications of our products. Please feel free to contact us directly, or your local ROTRONIC distributor.

I hope you enjoy reading this edition of Humidity News.

Peter Müller
Product Manager
Humidity and Temperature
Measurement

THE WINNER OF OUR COMPETITION

Again our competition has had a huge number of entrants. The lucky winner is Mr. Emmanuel Petit of CSTB; an engineering company in Paris (France) which deals with engineering performance for the construction industry. The picture shows Christophe Thubert of ROTRONIC France, presenting Mr. Emmanuel Petit with the prize from the last Humidity-News competition: an iPaq H3950 from Compaq. Try again with our new competition where the prize is a Tri-Band mobile telephone, Nokia 6610. Find out more on page 12.

And don't forget to download the free software for humidity calculations for your iPAQ:
www.rotronic.ch

COMPETENT SUPPORT FOR ROTRONIC-PRODUCTS

After successfully completing a training course for new ROTRONIC staff, the instructor, Mr. Bernard Cretinon is presented with a HygroPalm 3 instrument by Thomas Ryan, CEO of ROTRONIC SARL France. Mr. Cretinon is responsible for the Hygrometry laboratory at CETIAT, which is the French national standard. ROTRONIC has maintained a good relationship with CETIAT for many years. The ROTRONIC staff are proud to forward knowledge to their customers and continue their expert support of ROTRONIC products and their application.

ROTRONIC AT METEOREX 2002

At the Meteorex Conference 2002 /TECO 2002 in Bratislava from September 23 to September 25 2002, ROTRONIC presented the latest instruments for measurement of weather data. On the picture of the opening ceremony, we see in the foreground, from left to right:
Mr. Dieter C. Schiessl (Director of Weather Watch, WMO), Dr. Stefan Skulec (Director General, Slovak Hydrometeorological Institute, SHMI), and Mr. S.K. Srivastava, (President of CIMO).

More than 60 exhibitors displayed their equipment at the conference which was organised by the Hydrometeorological Institute (SHMI).

Preface

Visit ROTRONIC at the following exhibitions:

- **Automaticon: 1. - 4.4.2003**
  Warsaw, Poland
- **Interklima: 8. - 12.4.2003**
  Zagreb, Croatia
- **Construction & Equipping: 8. - 12.4.2003**
  Zagreb, Croatia
- **ELCRO Electronics, Automation & Measurements: 8. - 12.4.2003**
  Zagreb, Croatia
- **METEOHYDEX 6. - 8. 5.2003**
  Geneva, Switzerland
- **Sensor: 13. - 15.5.2003**
  Nürnberg, Germany
- **Achema: 19. - 24.5.2003**
  Frankfurt, Germany
- **Interklima: 27. - 30.5.2003**
  Sarajevo, Bosnia-Herzegowina
- **Gradnja i Obnova, 27. - 30.5.2003**
  Sarajevo, Bosnia-Herzegowina
- **SIPEC: 7. - 9.10.2003**
  Orleans, France

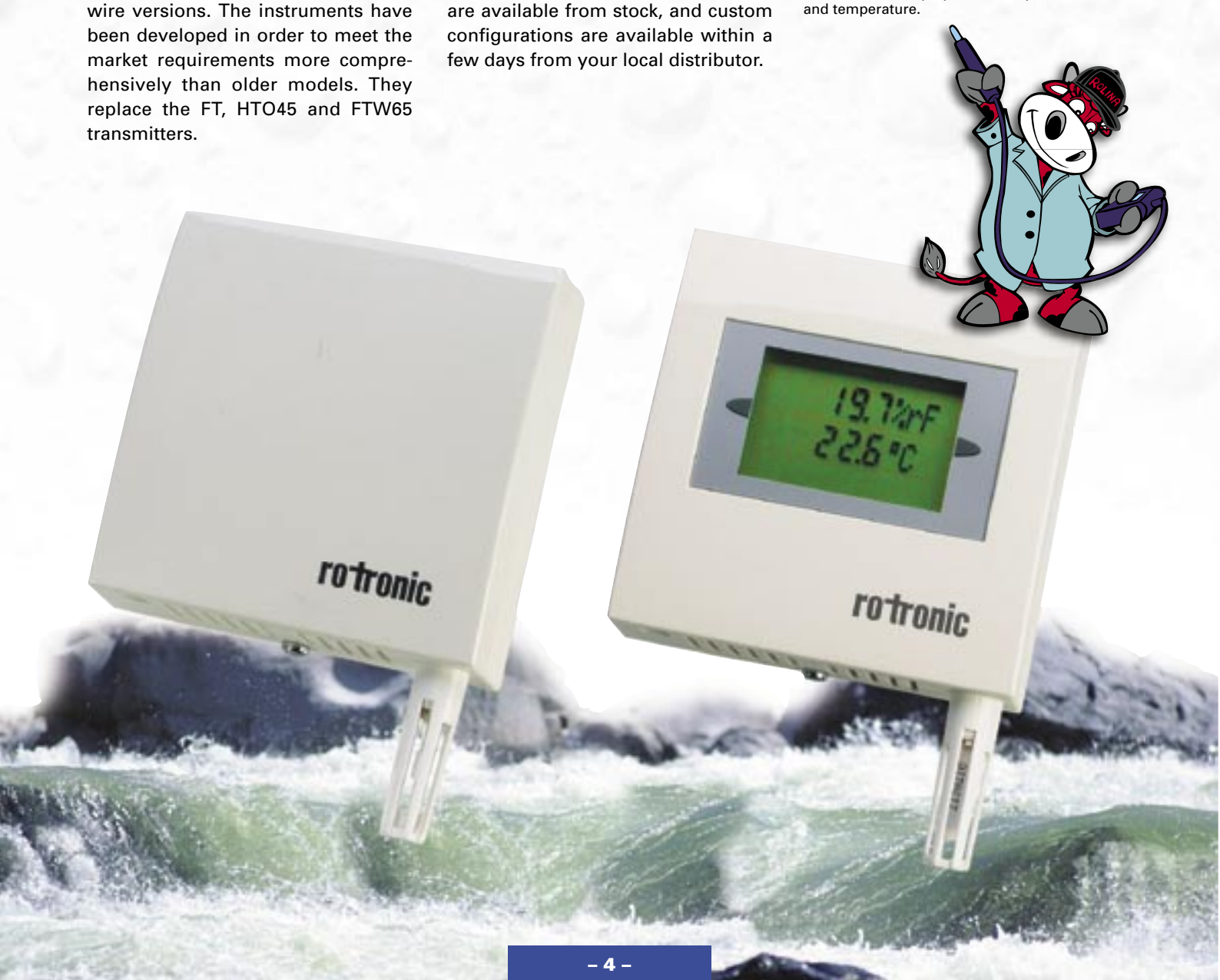
NEW, PRECISE, FLEXIBLE AND WELL-PRICED!
THE NEW M1 SERIES TRANSMITTERS

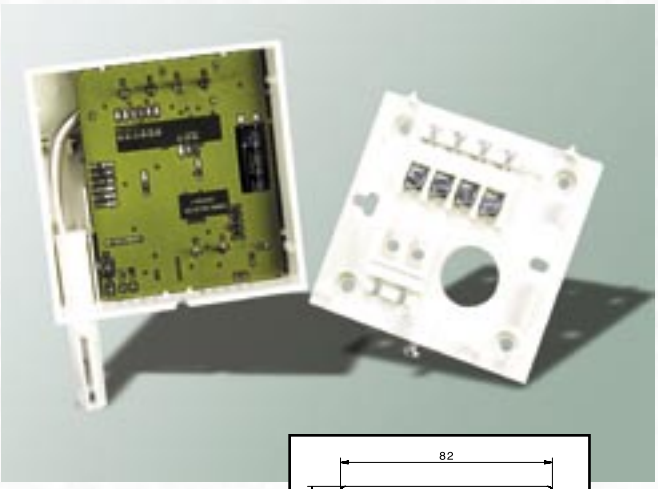
The measurement of humidity and temperature in the HVAC business becomes more challenging with every year that passes. On the one hand, the demands for precision are higher, on the other, price sensitivity is increasing. ROTRONIC continues an uncompromising strategy of high quality, for which we have been known throughout the world for many years. Thanks to new and innovative technologies, even instruments for low cost HVAC applications can be offered. The M1-Series transmitters are available in 3 basic versions: space, duct and wall mounting. Within these basic types, we further differentiate between 2- and 3/4-wire versions. The instruments have been developed in order to meet the market requirements more comprehensively than older models. They replace the FT, HTO45 and FTW65 transmitters.

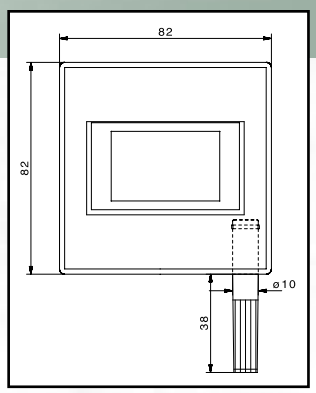
The new M1-Series from ROTRONIC performs to the highest standards by using the latest digital technology. They can be delivered with industry standard output signals 0...1 V, 0...5 V, 0...10 V, 0...20 mA, and 4...20 mA. The output signals can also, under certain conditions, be scaled with infinite variables. As a result, the measurement resolution will be improved, as it will be possible to scale the measuring range from e.g. 0…10 °C to 4…20 mA. In fact almost any range can be scaled exactly to the requirements of the customer, so that control systems can perform more precisely, and therefore more efficiently. The most popular types are available from stock, and custom configurations are available within a few days from your local distributor.

The new space mount M1S replaces the old models from the FT series. It offers you a unique feature:
a retractable probe! Thanks to this feature, the instrument can be easily calibrated on site unlike any other space mount transmitter. Using the HygroPalm handheld instrument, the transmitter can be adjusted without potentiometers. A new design calibration device is also now available and offers significant improvements in comparison with the previous design, including better probe sealing and easier handling.

Optional display for model M1S
Simultaneous display of humidity and temperature.







This new generation of measuring instruments is suited to situations where either the use of an exchangeable probe for safety reasons or regulations is out of question, or where price is an important consideration. The space-mount transmitters may be used where a wall-mount transmitter cannot be installed for aesthetic reasons. Their unobtrusive and enjoyable colour also fits into demanding environments.

Thanks to advanced technology, the output signals can be scaled.

This is especially important in controlled environments such as in office buildings, schools, museums etc. Through the possibility of signal scaling, the minimum and maximum values can be set within a smaller range, and the control hardware can work more efficiently, which, in turn, improves control accuracyand saves energy.

They are amongst the best priced instruments on the market with an outstanding accuracy.

All transmitters of the M1 series may be plugged onto a mounting plate in the same manner as the well-known F/T series. This simplifies the installation and reduces the service cost.

ROTRONIC instruments especially distinguish themselves by the excellent longterm stability of the humidity sensors. Compared with other products, this means lower cost of ownership through lower service costs and longer lifetime!

Calibration with HygroPalm Handheld

Interesting for OEM's

The electronics may of course be integrated into other housings. Ask us for a quotation. Even for projects with comparatively small quantities, it may be worthwhile using ROTRONIC OEM product instead of developing an own product. The cost for test-equipment, calibration and engineering are often underestimated. Even if you don't need huge numbers, ROTRONIC will have a cost effective solution.

Unique space mount transmitter for calibration with humidity standards

The M1 space mount is the only transmitter in the market that can be calibrated directly with certified humidity standards thanks to a retractable probe. From a measurement perspective, the retractable probe is a huge advantage: Because the probe is distant from the electronics, it will not be heated up, which in turn makes the measurement more accurate.

Key Features:

- Modern, attractive design based on digital technology
- Retractable probe on M1S for more accurate measurements
- Optional display on M1S model
- Remote diagnosis with a hand held instrument
- Stable, precise and reliable
- Scaleable output signals
- All standard output signals available
- Temperature range -40...60 °C
- Protection rating IP33

WHAT DOES HUMIDITY HAVE TO DO WITH DEEP SPACE MISSIONS?

The European deep space antenna project in New Norcia (Western Australia)

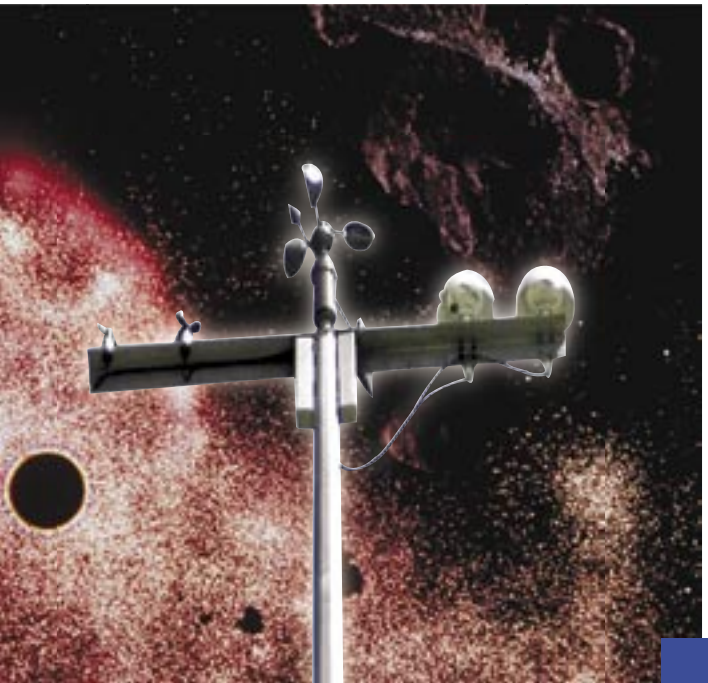
The European Space Agency operates and maintains a network of ground stations, which consists of several stations using 15m antennas in the short wave band for telemetry, command and tracking in support of spacecraft operations. A 35 m Deep Space Ground Station at New Norcia (Western Australia) now augments this network, and was ready for operational use as of autumn 2002.

The facilities also feature 3 ROTRONIC HygroFlex 2 temperature and humidity transmitters, which transmit climatic humidity and temperature data via an RS232 interface directly to the European Space Operations Centre (ESOC) in Darmstadt (Germany). Sensors are mounted within ROTRONIC VHTS2 ventilated radiation shields on a collapsible aerial mast, with the HygroFlex transmitters installed in an enclosure underneath, and are powered by a solar panel and battery. The weather data is used to improve the directional accuracy required for deep space missions especially in the X-Band (ca. 8 GHz). Directional errors caused by, for example, weather dependent atmospheric refraction that can be corrected by the so-called refraction model. The refraction index is a function of temperature, humidity, atmospheric pressure and antenna elevation. The antenna is calibrated using stars as signal sources and positional references, provided there is no wind load on the mechanical structure. Wind speed information is used to disable the correction process when certain speed is exceeded.

The New Norcia antenna is one of the largest in the world used for Telemetry, Tracking and Command (TT&C) applications and represents the jewel in the network of ground stations operated by the ESOC. This exceptional antenna is required for high performance communications with deep space and high elliptical orbit missions, in particular for the European Space Agencies (ESA) science missions Rosetta and Mars Express. Reliable "long distance communications" between the New Norcia ground station and the Rosetta spacecraft are essential to acquire scientific data collected by the instruments on-board the spacecraft. It also allows the operations centre to remotely control the spacecraft and it's Instruments over distances of up to 900 million kilometres away from Earth, more than six times the distance from Earth to the sun. As with all other ESA ground stations, the New Norcia antenna will be remotely controlled and operated from ESOC at Darmstadt.

The ESA is planning to enlarge the network by a second antenna of the same size in Europe.

This represents a further step in the enhancement of the European Deep Space network in the Ka band, and is core to the future of the Aurora project.



ROTRONIC SENSORS IN THE BRICK INDUSTRY

Rainer Hofmann
ROTRONIC
Germany

The history of brick manufactures can be traced back to at least the 3rd millennium BC. We know that the ancient Egyptians also used bricks when building the Temples of Karnak, and the Romans were prolific in their use.

Today the brick industry has to deal with the challenge of manufacturing a better quality brick in immense quantities. This means that the manufacturing process is becoming more and more automated, and that better and better process control is required. In parallel, reduction in energy consumption is a high priority. Before the bricks are fired, they are placed in a drying chamber for about 44 hours where the moisture is extracted.

The company Olfry has been producing bricks and tiles in all their possible forms for around the last one hundred years. For the last 15 years they have been using ROTRONIC humidity and temperature transmitters to control the drying process. The benefits of humidity control are clear; bricks which are fired with too much moisture within their structure crack or explode. If the brick is over dried, unnecessary amounts of energy is expended.

The exact measurement of humidity in the brick and tile industry has often created a problem:

As the bricks enter the drying chambers with a very high moisture content, condensation often forms on the surfaces of the drying chamber, and more significantly, on the measurement probe. This causes corrosion of metals including the connections of the humidity and temperature sensors. Depending on the levels of condensation formed, and the control strategy, the life of the sensors could be anything from a few weeks, to a few years. When sensors fail, they of course have to be replaced and this could prove costly for the customer. Perhaps more significantly, incorrect measurements cause failures of the process control, leading to higher scrap rates and less profit for the brick manufacturer.

It is clear that other solutions have been sought, but at that time, there was simply no alternative.

Solution:

By working closely with the company Olfry, ROTRONIC has made a start in tackling the problem. A special RS70 heated sensor together with a newly developed circuit has been used and remedied the problem. Whenever the relative humidity is above 85 %rh, the sensors are heated. As soon as the humidity falls below this threshold, the heating is switched off and the measurement is performed in the usual way. Thanks to this technology, the condensation of water vapour is avoided, and the life time of the sensors has been multiplied.

The ROTRONIC probes, installed on the roof of a drying chamber

The new probes have been in use for the last two years. According to the acting deputy manager Mr. Viefhues "They have functioned correctly for the past two years without causing us any problems. This has led to us replacing the existing probes with the new type. It has completely solved our problems."

Ask for ROTRONIC support and consultation for your high-humidity application!

HUMIDITY ABSORPTION FROM MUNTER WITH ROTRONIC HUMIDITY INSTRUMENTS

Josef Farcher
Projectmanager
Munters (Switzerland) AG

Munters is a company renowned throughout the world for air dehumidifying systems. The new Munters IceDry system for cold rooms and refrigerated storage has for a period of time been tested and on sale in the USA and England. It is now available across Europe. It dehumidifies the air that penetrates into cold areas, especially through open doors and conveyor belt openings. The dry air eliminates the risk of accidents caused by slippery ice, and significantly reduces the need for deicing. This system will also improve working conditions in a cool room; dry floors, less humidity in the air, and the elimination of icing improves safety and profitability. Munters cooperates with ROTRONIC in many countries. For example, the bridge over the Öresund between Sweden and Denmark was furnished with dehumidifying systems from Munters. The humidity measuring instruments were naturally from ROTRONIC. Munters (Switzerland) AG puts ROTRONIC transmitters before all others. Josef Farcher, project manager of Munters (Switzerland) AG explains: "We use ROTRONIC instruments for all process-controlled installations because they have a superior standard of quality. The humidity sensors are extremely long lasting and accurate. The instruments of the M3 series are capable to calculate psychrometric parameters. But what is especially important is the interchangeability of the probes, which has reduced our service costs immensely. A ROTRONIC HygroClip sensor can be exchanged in seconds. Also the transmitter doesn't need to be switched off. A diagnosis or system validation by computer is no problem with the new M series devices thanks to a service interface. It means that there is no downtime. And of course the competitive prices of ROTRONIC instruments are a convincing argument."

The build up of ice in cold rooms and refrigerated warehouses is a well-established problem. The humidity in the air condenses and forms ice on countless surfaces, for example on the floor. Every time more humid air enters the room, the pockets of ice get larger so that after a certain period of time the room must be defrosted.

The humidity measuring instruments from ROTRONIC's M series are used to control the dehumidifier, and make it possible to obtain precise control within narrow margins, and therefore contribute significantly to energy optimisation. They can, depending on the application, provide measurement of relative humidity, or psychometric calculations plus the temperature.
The life cycle of machines and facilities is increased when there is less humidity, servicing intervals are reduced because of the lower levels of corrosion. Manual cleaning becomes a thing of the past. The advantage of this system will become especially clear in summer and autumn. With IceDry the build up of ice almost completely fails to appear, even in summer. The necessity to defrost the plant becomes less and less frequent, and cold rooms can be kept dry with the new IceDry system from Munters

ROTRONIC instruments contribute, through their high level of precision and the possibility of performing psychrometric calculations, to a plant which optimises energy use and operates at a favourable cost. The dry air prevents the growth of mould and other micro-organisms, which is clearly important in cold rooms, especially where groceries and other perishable products are stored.

CLIMATE SURVEILLANCE IN VIENNA PALACE LIECHTENSTEIN

Ernst Aringer
Sales Manager Pauli & Menden Austria

The construction of Liechtenstein Palace was completed in 1705. Many famous artists worked on this impressive building, designed to be the summer residence of Prince Johann Adam Andreas of Liechtenstein (1657–1712). The art loving prince insisted on the magnificent furnishing of his summer

property and commissioned some of the most respected artists of his time.

Use of the Palace over the course of centuries

In the 18th century, the garden palace was used as the summer residence of the Liechtenstein family and to celebrate various festivals. At the beginning of the 19th century, Prince Johann I. Josef of Liechtenstein (1760 - 1836) decided to concentrate the family's extensive art collection from various palaces and castles at the Liechtenstein Palace. It remained there until 1944 and 1948, when it was moved to Vaduz as a result of the war. The building, including the ceiling works were subject to a basic restoration in 1978/79.

The collection of the Prince of Liechtenstein will return to the Danube metropolis in early 2004. One of the largest collections of Rubens, important works of Van Dyck, Lucas Cranach and Raffael are just as wonderful as those of Rembrandt, van Ruysdael and Hamilton.

Climate Control

It is clear that all of these works of art are extremely valuable and correspondingly must be protected, conserved and stored correctly. Control of the climate surrounding the various works is the most important factor. Of course the climate of the exhibition rooms was considered in the course of the renovation. Because the palace is a protected building, conventional air conditioning with ventilation ducts could not be used. Fan coils, which are mounted behind the wood of the sills, were chosen. To control the relative humidity of the exhibition rooms, over 50 ROTRONIC transmitters of the FH series were installed. Thanks to these, the aesthetic demands of the architecture can be fulfilled. The transmitters have been mounted next to the hidden fan coils. The HygroClip S probes were sunk into the wall by special flanges so that only the probe tips are visible. The connecting cables run under the plaster to the measuring sensors.

An important factor in the purchasing decision was the simple interchangeability of the HygroClip sensor, which is of great importance for such applications. Since the installation is concealed, it is especially im-

portant that the probes can be easily replaced without particular expense. A welcome side effect is that service costs are also reduced in this way. ROTRONIC has miniature sensors for use in museums of 4mm and 5mm diameter respectively, which can be installed practically anywhere and are virtually invisible.

HUMIDITY MEASUREMENT ON THE MOVING PAPER WEB

Roland Scheurich
ROTRONIC
Germany

Bayropa Jung GmbH, situated in Wertingen, Germany celebrated its 25th anniversary in the year 2000. The "paper tiger", as Bayropa are also known, not only have extensive printing experience, but also possesses state-of-the-art roll-offset printing machinery with paper-widths up to 100 cm, and DIN A4 production lines for pre-printed laser paper with a throughput of 6600 sheets per minute. Of course, Bayropa is also using state-of-the-art technology for their humidity measurement.

Humidity is a very important parameter in the paper and printing industry. Humidity influences the characteristics of a printing process, especially in high volume laser printers. When the paper humidity is not correct, the paper tends to curl, and hence is unacceptable to customers.

Problem: Statistical data alone is not enough to maintain high quality. Paper manufacturers only provide average humidity values for paper webs of more than 10m in width. Therefore, single paper rolls may well be out of tolerance. This is the result of the paper production process, which delivers paper webs of 10 m width, that are cut into smaller webs only at the end of the manufacturing process.

The solution is online measurement of equilibrium relative humidity (ERH) and temperature on the web, running at 500m per minute. It serves to detect and reject rolls that are out of tolerance.

The online measurement at Bayropa Jung is achieved with one ROTRONIC BFC-DIO web probe at the machine input, and one at the output of the machine, with the measurement data managed with HygroFlex transmitters. On-line measurement offers the following advantages:

- Uninterrupted measurement of ERH and temperature on the moving web, and hence the possibility to control the process.
- Avoidance of finish problems by customers
- Simple logging of the measurement values with validated ROTRONIC HW3 WINDOWS software
- Alarm function when exceeding threshold values

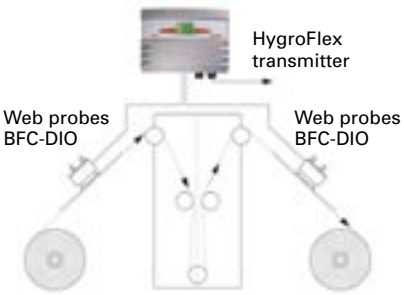
A consistent and defined humidity is of great importance when paper is being printed in order to achieve good printing results.

The measurement principle grants a practical and low priced measurement of equilibrium humidity and temperature on the moving paper web

Web probe BFC-DIO

The web probe BFC-DIO is installed directly under or above the moving web, but without direct contact. The humidity and temperature of the paper creates a microclimate in the confined space in and around the measurement chamber that is directly measured. With this simple and well-priced instrument, paper quality can be monitored without interruption, and important conclusions can be made in order to increase the productivity and profitability.

Schematic diagram with two BFC-DIO web probes



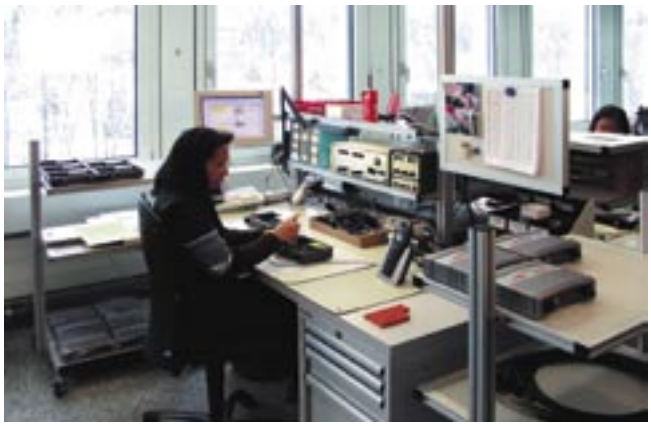
PRODUCTION OF ROTRONIC HUMIDITY MEASUREMENT EQUIPMENT

Leonhard Löw
Production Manager

ROTRONIC AG has continuously been developing humidity and temperature instruments for over 30 years. Initially we produced measurement products for a demanding customer base almost exclusively by hand. During the early 1980's, we introduced Surface Mount Device (SMD) Technology at a very early stage in its development as a manufacturing technique. Today nearly every modern electronic product is produced this way. As our volumes increased, more and more new production facilities and methods were introduced.

In 1995 the decision was taken to develop one of the worlds first humidity specific ASIC (Application Specific Integrated Circuit), because the market demanded exchangeable probes, which could only be realised by this technique.

It was essential that the core ROTRONIC philosophies of quality and precision should not be in any way sacrificed. Whilst our core products are produced in high volumes to provide short lead times, we are also able to offer new or customised solutions with a short development and production cycle, whilst maintaining our commitment to ISO 9000 quality procedures. These core ROTRONIC competencies are only possible because of our team of dependable and motivated employees, who, thanks to their commitment and job satisfaction, produce one of the worlds most respected humidity product ranges.



ROTRONIC manufactures more than 4'000 different products. To compete with these challenges, the workplace has been continuously adapted to meet the current requirements. Employees receive ongoing training. Each assembly workplace is equipped with a flat screen monitor, which is used to display all necessary production documentation such as designs, procedures, specifications and images. With a fully integrated sales order and production processing system, and optimised stock control and logistics, we are able to satisfy all our customers needs, from bulk OEM transmitter supplies through to a one-off custom humidity transmitter

The most fundamental part of the ROTRONIC product is the humidity sensor. Pioneering work over 30 years ago with the development of electrolytic Q sensor produced one of the world's first electronic humidity instruments. In 1980 came the development of a humidity sensor which could be cost effectively produced, and proved to be capable of measurement over the range 0…100 %rh and 50…+200°C. The Hygromer® C80 developed into the C94, and today the Hygromer sensor range still provides the widest direct operating range in the world. We are able to produce a range of Hygromer® sensor derivatives to satisfy specific application or market needs. These include market leading solutions for drying, water activity (ERH), meteorology and climate control.

ROTRONIC also offers traceable humidity standards at reasonable prices. They consist of unsaturated salt solutions, which are very easy to handle, and offer best possible uncertainty of a portable calibration system thanks to their traceability to national standards. More than 100'000 standards in a wide range of values from 0 to 95 %rh are produced and sold every year.

For the factory adjustment of our products, we use dynamic humidity generators developed inhouse. They provide a fast, efficient and traceable calibration reference over the whole humidity measurement range. We have been an accredited SCS calibration laboratory for relative humidity since 1995; according to the new ISO/IEC 17025 norm since 2002.

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1. Which output signals does the M1 transmitter provide?
- ❑ 0...1 V, 0...5 V, 0...10 V
- ❑ 0...20 mA, 4...20 mA
- ❑ all of them selectable

2. Where is the ESA Deep Space Station located?
- ❑ Australia
- ❑ America
- ❑ Africa

3. Which products does OLFRY manufacture?
- ❑ Bricks
- ❑ Bread
- ❑ Concrete products

4. Which M1 series transmitter has a display option?
- ❑ M1 Wall mount type
- ❑ M1 Duct mount type
- ❑ M1 Space mount type

5. How many ROTRONIC humidity standards are sold per year?
- ❑ 10'000
- ❑ 75'000
- ❑ >100'000

Sender:

Name:

Firm:

Street:

City:

Country:

Fon:

E-Mail:

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